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EXAMINER	
MYINT, DENNIS Y	
ART UNIT	**PAPER NUMBER**
2162	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/620,988	EVERETT, RON	
	Examiner	Art Unit	
	Dennis Myint	2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,7-9,11,13,15-37,40-62 and 81-96* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 5, 7-9, 11, 13, 15-37, 40-62, and 81-96* is/are rejected.

7)☒ Claim(s) *25,26,35,37,41,43,45,46 and 91* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 23, 2007 has been entered.

2. The amendment filed on August 3, 2007, has been received and entered. Claims 1-3, 5, 7-9, 11, 13, 15-37, 40-62, and 81-96 are pending in this application. Claims 1, 52, 82, and 85 are independent claims. In the Amendment filed on August 3, 2007, claims 1, 9, 11, 13, 15, 16, 21, 33, 40, 42, 44, 47, 52, 53, 82, and 85 were amended. Claim 2 is newly added. Claims 4, 6, 10, 12, 14, 38, and 39 have been cancelled.

Response to Arguments

3. With respect to the rejection of claims 1, 3, 5, 7-9, 11, 13, 15-35, 40-46, 49, 52-53, 60-62, and 82-96 under 35 U.S.C. § 101, Applicant argued that , *in an effort to advance the prosecution of this case, the Applicant has agreed to insert a recitation of functionality within the independent claims. With respect to claim 1, the Applicant has inserted the limitation in the claim that the arrangement of and information stored in the*

fundamental data structures allows the addition, removal and searching of data items stored in the data structures (Applicant's argument, page 25 second paragraph) and that *the other independent claim of the application, claim 52, also claims a data management system, however, this particular claim already has a recitation of functionality therein, containing the limitation that the encapsulated references to associated data structures are also logical indices which uniquely identify the encapsulated data instances and also encode the location of each of the instances on a computer readable media. Therefore, the function of locating this data on a computer readable media is recited in this claim, thereby rendering this claim statutory* (Applicant's argument, page 25 last paragraph).

MEPE 2106.01 [R-5] states that :

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, *it is not statutory since* ***no requisite functionality*** *is present to satisfy the practical application requirement.* Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in Benson were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer."). Such a result would exalt form over substance. In re Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) ("[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.") (quoted with approval in Abele, 684 F.2d at 907, 214 USPQ at 687). See also In re Johnson, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting"). Thus,
nonstatutory music is not a computer component, and it does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory and should be rejected under 35 U.S.C. 101. In addition, USPTO personnel should inquire

whether there should be a rejection under 35 U.S.C. 102 or 103. USPTO personnel should determine whether the claimed nonfunctional descriptive material be given patentable weight. USPTO personnel must consider all claim limitations when determining patentability of an invention over the prior art. In re Gulack, 703 F.2d 1381, 1385, 217 USPQ 401, 403-04 (Fed. Cir. 1983). USPTO personnel may not disregard claim limitations comprised of printed matter. See Gulack, 703 F.2d at 1384, 217 USPQ at 403; see also Diehr, 450 U.S. at 191, 209 USPQ at 10. However, USPTO personnel need not give patentable weight to printed matter absent a new and unobvious functional relationship between the printed matter and the substrate. See In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); In re Ngai, 367 F.3d 1336, 70 USPQ2d 1862 (Fed. Cir. 2004).

In response to Applicant's argument with respect to rejection of claim 1 under 35 U.S.C. § 101, it is pointed out that, despite the amendment made to claim 1, that is, addition of the limitation "wherein said data instances encapsulated in said data structures can be added, removed, and searched", data structures of claim1 still lack functionality. To be statutory, said data structures must include functionality which one expects from a data structure, that is the "manipulation of data" employing said data structures. In other words, said data structures must generate results. Because data structures of claim 1 fail to manipulate data and generate results, claim 1 is not statutory.

With respect to Applicant's argument regarding claim 52, claim 52 similarly lacks manipulation of data employing data structures recited therein and thus fails to generate results. As such claim 52 is non-statutory.

In view of the above, the examiner contends that the rationale for rejection of claims 1, 3, 5, 7-9, 11, 13, 15-35, 40-46, 49, 52-53, 60-62, and 82-96 under 35 U.S.C. § 101 has been addressed in this Action. For the above reasons, Examiner believed that rejection of the last Office action was proper.

4. With respect to the rejection under 35 U.S.C. § 103 (a), Applicant has argued that *the Applicants respectfully submits that the application of White is not proper in this instance because White teaches away form the invention in requiring that both it's data items and its associated type and relationship information be stored in relational database tables. This is clearly evidently in Figures 2 and 3 of White which shows this information being stored in tables, and in various other places in the White specification, in which a description of the use of tables in White is explained* (Applicant's argument, page 26 second paragraph), that *As a result of this teaching of White, the Applicant submits that the combination of White with any other reference is improper because White unequivocally teaches from the present invention* (Applicant's argument, page 26 third paragraph).

Examiner respectfully disagrees all of the allegations as argued. Examiner, in his previous office action, gave detail explanation of claimed limitation and pointed out exact locations in the cited prior art. Examiner is entitled to give claim limitations their broadest reasonable interpretation in light of the specification. See MPEP 2111 [R-1] Interpretation of Claims-Broadest Reasonable Interpretation.

During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.' Applicant always has the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969).

In response it is pointed out that, as discussed in prior office actions, White does not teach the limitation "in non-tabular form". However, Abineri teaches parent classes and children with attributes, organizing data without using tables (Abineri, paragraph 0060-0066). Particularly note paragraph 0106 of Abineri, which states "*Although the inventory system has been described in terms of a telecommunications network environment, the modified tree approach has applications in other databases* ***where flat file information*** *needs to be converted into* ***an object oriented database***. *Also as mentioned above, more than one object identifier can be employed in construction of the database*". As such, White in view of Abineri teaches a plurality of independent data structures having a common form, each of said data structures encapsulating a single stance and each of said data structures also encapsulating references to other of said independent data structures encapsulating associated data instances, wherein said plurality of data structures are in non-tabular form.

Applicant also argued that *Even if for the sake of argument, if Abineri did disclose a database in non-tabular form, it makes no sense to combine the teachings of a database in non-tabular form with a database that requires a tabular form, as does White database. As a result, the Applicants respectfully submits that this combination does not teach what the Examiner states and further that the combination of the two references is improper due to lack of teaching, suggestion or motivation within either of the references to make the combination* (Applicant's argument, page 27 second paragraph).

In response, it is pointed out that a person of the ordinary skill in the art would be

motivated to combine White and Abineri because database models could be combined in any way. For example, object oriented model is a combination of relational database model and object oriented model. Abineri even teaches converting a non-tabular model (i.e., a flat file database) into object oriented database model as recited in paragraph 0106. As such, it does make sent for a person of ordinary skill in the art to combine a flat file database (i.e., non-tabular form, as taught by Abineri) with object oriented database (as taught White).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, One would have been motivated to do so in order to emphasize generic relations between data structures (Abineri, Paragraph 0061).

Referring to claim 3, Applicant argued that *neither White nor Abineri shows the encapsulating of the references to data structures containing associated data instances within a data structure containing the data instances with which they are associated* (Applicant's argument, page 27 last paragraph).

In response, it is pointed out that White in view of Abineri and further in view of Plourde teaches the limitation: " wherein a first data instance is encapsulated with references to

associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance" (White, Column 6 Line 22-43 and Column 7 Line 18-38).

Referring to claim 7 Applicant argued that *Claim 7 contains the limitation that the encapsulated references are at least one dimension and that dimensions correspond to a type of association* (Applicant's argument, Page 28 second paragraph).

In response, it is pointed out that White in view of Abineri and further in view of Plourde teaches the limitation: "wherein said encapsulated references are in at least one dimensions; and each of said at least one dimensions corresponds to a type of association" (White, Column 7 Line 5-11, i.e., *The attributes of a given object may be used to encapsulate data and/or link to software functionality and/or processes pertinent to the given object. As shown in FIG. 3, a Type Table Entry for a given object type includes one or more object identifiers (or pointers or keys) that identify the objects that belong to the given object type*).

Referring to claims 9, 11, 13, 15-16 and 53, Applicant argued that *These claims are patentable by virtue of their dependence from other claims which the Applicant submits are patentable* (Applicant's argument, page 28 third paragraph).

In response, it is pointed out that, as discussed above and in prior office actions, the claims from which claims 9, 11, 13, 15-16 and 53 depend from are not patentable. As such, claims 9, 11, 13, 15-16 and 53 are not patentable as well.

Referring to claims 82-87, Applicant argued that *the Applicant respectfully submits that neither White nor Abineri teaches a system in which all associated data*

instances may be encapsulated within a single instance (Applicant's argument, page 28 last paragraph).

In response, it is pointed out that Abineri in paragraphs 0049-0068 and Abineri paragraphs 0061-0067 in view of White Figure 1 and column 4 lines 47-55 teaches a system in which associated instances are encapsulated within a single instance.

Referring to claim 85, Applicant argued that *claim 85 contains limitations very similar to those of claim 1 and for the reasons as respect to claim 1, the combination of White and Abineri does not render this claim obvious* (Applicant's argument, page 29 second paragraph).

In response, it is pointed out that, as discussed with respect to claim 1, White in view of Abineri teaches the system of claim and, as such, said combination also teaches the limitations of claim 85.

Referring to claim 89, Applicant argued that *claim 89 claims that associated items are arranged in sets within each encapsulation which define the types of associations between items. This is similar to claim 7 and the same arguments apply here as well* (Applicant's argument, page 29 third paragraph) and that *No mention is made in this passage of the type of association between objects but merely the type of the objects themselves* (Applicant's argument, page 29 third paragraph).

In response, Applicant is directed to the response above, made with respect to claim 7. Please refer to White 3 and column 7 lines 44-61 which states "**Relation Type** Table Entry". Relation type is association type.

Referring to claims 5, 8, 18-24, 31-34, 36, 47-48, 50-52, 54-60, 62, 88, 90, and 93, Applicant argued that *The Examiner's interpretation of Kroenke appears to be incorrect in that it does not disclose an "m dimensional" index but disclose a one dimensional attribute having a minimum number of instances and a maximum number of instances* (Applicant's argument, page 31 first paragraph).

In response, it is pointed out that Kroenke teaches the limitation "wherein said logical index is "m" dimensional and, has "n" bits per dimension" (Kroenke, Figure 2, Column 6 Line 26-65, and Column 14 Line 4-17). Kroenke teaches an object data model for semantic relationships wherein such logical indexes (attributes) "m" dimensional (Kroenke et al., Figure 2 and Column 6 Line 26-65) and has "n" bits per dimension (Kroenke et al., "length", Column 14 Line 4-17).

Referring to claim 8, Applicant argued that *as previously stated, the use of relational table in White teaches away from the present application, which encapsulates all relationship information within an independent data structure for each data object. As a result, these portions of White are not applicable the present application* (Applicant's argument, page 31 second paragraph).

In response, it is pointed out that, as discussed above with respect to claim 1, White in view of Abineri teaches the systems of claim 1 and the cited parts of White are applicable to limitations of claim 8.

Still referring to claim 8, Applicant argued that *Nothing in this portion of Kroenke or anywhere in Kroenke is taught an multi-dimensional index wherein each dimension of*

the index is related to a plurality of encapsulated references (Applicant's argument, page 31 second paragraph through page 32 first paragraph).

In response, it is pointed out that White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation: "wherein each of said at least one dimensions has a plurality of said encapsulated references" (White, Column 7 Lines 5-11, Column 7 Lines 45-52 and Kroenke, Column 6 Line 26-65).

Referring to claims 18-22, Applicant argued that *as such are patentable based on their dependence from other claims* (Applicant's argument, page 32 second paragraph).

In response, it is responded that, as discussed in current and prior office actions, since their parent claims are not patentable, said claims are not patentable as either.

Referring to claim 23, Applicant argued that *this concept is not known in any database management system of which the Applicant is aware and certainly not disclosed in Kroenke* (Applicant's argument, page 32 third paragraph).

In response, it is pointed out that White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations: "a search capability for finding specific unknown encapsulated data instances from a selection criteria of known encapsulated data instances by accessing said known encapsulated data instances representing said selection criteria" (White Column 23 Lines 42-50 and Kroenke Column 12 Lines 15-44) "comprising the steps of": "accessing references encapsulated with said known encapsulated data instances representing said selection criteria" (White Column 23 Lines 42-50 and Kroenke Column 12 Lines 15-44); "using Boolean operations to compare said accessed encapsulated references to find references to

said specific unknown encapsulated data instances" (White Column 23 Line 42-50 and Kroenke Column 12 Line 15-44); and "retrieving said specific unknown encapsulated data instances" (White Column 23 Line 42-50 in view of Kroenke Column 12 Line 15-44).

Referring to claim 24, Applicant argued that *the Applicant's remarks with respect to claim 7 apply here as well* (Applicant' argument, page 32 fourth paragraph). In response, Applicant is directed to the response with respect to claim above.

Referring to claim 36, Applicant argued that *Neither White Nor Kroenke teach this limitation* (Applicant's argument page 33 first paragraph). In response, it is pointed out that White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations: "a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance" (White Column 6 Line 66 through Column 7 Line 11, Column 7 Line 18-38, and Column 6 Line 23-43); "wherein each of said encapsulated references is a logical index which uniquely identifies each of said associated encapsulated data instances and also encodes the location of each of said associated encapsulated data instances on said computer readable media" (White, *pointers or keys*, Column 7 Line 5-11); and "wherein said logical index is `m` dimensional, and has `n` bits per dimension" (Kroenke, *length*, Column 14 Line 4-17); and "the encapsulated references of two or more different encapsulated data instances compared such for at least one of commonality, similarity

and difference to derive sets of references corresponding to said desired results" (White Column 23 Line 42-50 and Kroenke Column 12 Line 15-44)

Referring to claim 17, Applicant argued that *White does not teach a multidimensional index and, therefore, cannot teach that an identity in one of the dimensions indicates membership in an container item (*Applicant's argument page 33 second paragraph).

In response, is pointed that White in view of Abineri and further in view of Plourde and further in view of Silberberg as a combination teach said limitation (s) as follows: "wherein at least one of said encapsulated references is a reference to an encapsulated data instance in another computing environment" (Silberberg, Column 5 Line 48 through Column 6 Line 54). Silberberg et al. discloses architecture for distributed database information access wherein data instances are located in different computing environments (Column 5 Line 48 through Column 6 Line 54).

Referring to claims 27-30, Applicant argued that *within context of the database system presented in the parent claims of 27-30, the use of Boolean mathematical operations to sort through lists of encapsulated data instances for the purposes of searching satisfying search criteria is not disclosed in the cited references* (Applicant's argument, page 33 last paragraph).

In response, it is pointed out that White in view of Abineri teaches the system of the parent claims and, as such, Boolean operations of Walker are applicable to the system of White in view of Abineri.

Referring to claim 40, Applicant argued that *Bielak dose not come close to*

teaching that individual characters may be stored as individual data items in a database and be referred to by other data items which require the use of that particular ASCII character (Applicant's argument, page 34 first paragraph). Claim 40 is rejected as being obvious over the combination of White in view of Abineri and further in view Bielak. As such, White in view of Abineri and further in view of Bielak teaches the limitations as follows:

"a plurality of encapsulated data instances (White in view of Abineri) representing ASCII characters" (Bielak, Column 12 Line 64 through Column 13 Line 12);

"said common fundamental data structures containing said encapsulated data instances (White in view of Abineri) representing ASCII characters (Bielak, Column 12 Line 64 through Column 13 Line 12) also containing encapsulated references to encapsulated data instances (White in view of Abineri) using one or more of said ASCII characters (Bielak, Column 12 Line 64 through Column 13 Line 12);" and

"said common fundamental data structures containing encapsulated data instances (White in view of Abineri) using one or more said ASCII characters (Bielak, Column 12 Line 64 through Column 13 Line 12) also containing encapsulated references to said encapsulated data instances (White in view of Abineri) representing said used ASCII characters" (Bielak, Column 12 Line 64 through Column 13 Line 12). Bielak et al. teaches a system and method for persistent databases, wherein ASCII characters are encapsulated in data objects (Column 12 Line 64 through Column 13 Line 12).

Referring to claims 17, 49, and 61, Applicant argument argued that *Silberberg*

*teaches a specific architecture for accessing the information stored in other environments which is different than the architecture described in the present application*s (Applicant's argument, page 34 last paragraph). In response, it is pointed out that White in view of Abineri teaches one architecture which could reference information in another architecture taught by Silberberg.

Referring to claims 94-96, Applicant argued that the Applicant respectfully submits that there is no teaching, suggestion or motivation for citing Suver with respect to the present application (Applicant's argument, page 35). In response, it is pointed out that White in view of Abineri and further in view of Plourde and further in view of Suver teaches the limitations of claims 94-96 as discussed in prior and current office actions. For instances, White in view of Abineri and further in view of Plourde and further in view of Suver teaches the limitations of claim 94 as follows:

"wherein each of said items may encapsulate embedded elements."

Suver teaches the limitation: "wherein each of said items may encapsulate embedded elements" (Column 10 Line 9-27). Suver teaches a method and system for storing and accessing embedded information in object-relational databases wherein data instances encapsulate embedded elements (Column 10 Line 9-27).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in

the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one would have been motivated to do so in order to "allow for storing and access of embedded complex information in both the relational data modeling and object-oriented data modeling" (Suver, Column 2 Line 44-48).

In view of the above, the examiner contends that all limitations as recited in the claims have been addressed in this Action. For the above reasons, Examiner believed that rejection of the last Office action was proper.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-3, 5, 7-9, 11, 13, 15-37, 40-62, and 81-96 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 recites data structure per se: "(a) a plurality of independent **data structures having a common form**, each of said data structures encapsulating a single instance; (b) each of said data structures also encapsulating references to other of said independent data structures encapsulating associated data instances; and (c) wherein said plurality of data structures are stored on a computer-readable media in

non-tabular form and further wherein said data instances encapsulated in said data structures can be added, removed, and searched".

The claimed data structures must have final result(s) achieved, which is/are useful and tangible as set forth in MPEP 2106 (IV)(B)(2)(a). Data structures per se are non-statutory because data structures per se are non-functional descriptive materials. The data structures per se as recited in claim 1 comprise no functionality, that is, claim 1 comprises no functions, which would produce tangible and concrete results.

MEPE 2106.01 [R-5] states that :

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, *it is not statutory since* ***no requisite functionality*** *is present to satisfy the practical application requirement.* Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in Benson were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer."). Such a result would exalt form over substance. In re Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) ("[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.") (quoted with approval in Abele, 684 F.2d at 907, 214 USPQ at 687). See also In re Johnson, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting"). Thus,
nonstatutory music is not a computer component, and it does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory and should be rejected under 35 U.S.C. 101. In addition, USPTO personnel should inquire whether there should be a rejection under 35 U.S.C. 102 or 103. USPTO personnel should determine whether the claimed nonfunctional descriptive material be given patentable weight. USPTO personnel must consider all claim limitations when determining patentability of an invention over the prior art. In re Gulack, 703 F.2d 1381, 1385, 217 USPQ 401, 403-04 (Fed. Cir. 1983). USPTO personnel may not disregard claim limitations comprised

of printed matter. See Gulack, 703 F.2d at 1384, 217 USPQ at 403; see also Diehr, 450 U.S. at 191, 209 USPQ at 10. However, USPTO personnel need not give patentable weight to printed matter absent a new and unobvious functional relationship between the printed matter and the substrate. See In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); In re Ngai, 367 F.3d 1336, 70 USPQ2d 1862 (Fed. Cir. 2004).

Therefore, claim 1 rejected under 35 U.S.C. §101 because said claim recites data structures per se.

Claims 2-3, 5, 7-9, 11, 13, 15-37, 40-62, and 81-96 are similarly directed to data structures per se and are rejected under 35 U.S.C. § 101.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 3, 7, 9, 11, 13, 15, 16, 53, 82-87, 89, and 92 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. (hereinafter "White") (U.S. Patent Number 6609132) in view of Abineri et al. (hereinafter "Abineri") (U.S. Patent Application Publication Number 2005/0044079) and further in view of Plourde, JR et al., (hereinafter "Plourde") (U.S. Patent Application Publication Number 2003/0110513).

As per claim 1, White is directed to a data management system in a computing environment (Column 5 Lines 3-25) and teaches the limitations:

a) "a plurality of independent data structures having a common form, each of said data structures encapsulating a single data instance" (White, Column 6 Line 66 through Column 7 Line 11, i.e., *FIGS. 2 and 3 illustrates an exemplary embodiment of logical* ***data structures*** *representing the inventive object data model of the present invention, including a plurality of objects (****Object A, Object B, Object C and Object D*** *as shown) each having a plurality of attributes (as data members) for storing useful information that describes characteristics of the corresponding object. The attributes of a given object may be used* ***to encapsulate data and/or link to software functionality and/or processes pertinent to the given object****. As shown in FIG. 3, a Type Table Entry for a given object type includes one or more object identifiers (or pointers or keys) that identify the objects that belong to the given object type*); and

b) "each of said data structures also encapsulating references to other of said data independent data structures encapsulating associated data instances" (White, Column 6 Line 66 through Column 7 Line 11, Column 7 Line 18-38, and Column 6 Line 23-43); and

"(c) wherein said plurality of data structures stored on a computer-readable media" (White Figure 1 and Column 4 Lines 47-55, i.e., *the various computational routines of the present invention are typically stored persistently in a storage device 11 (which may be a hard disk, drive, optical disk drive or other persistent storage means) that is operably coupled to memory 3*).

White does not explicitly teach the limitation: "in non tabular-form" and "wherein said data instances encapsulated in said data structures can be added, removed, and searched". Examiner interprets the limitation "in non-tabular form" in light of the specification that said data structures does not employ tables.

On the other hand, Abineri teaches the limitation:

"in non-tabular form" (Abineri, Paragraph 0061-0066). Abineri teaches parent classes and children with attributes, organizing data without using tables. Particularly note paragraph 0106 of Abineri, which states "*Although the inventory system has been described in terms of a telecommunications network environment, the modified tree approach has applications in other databases* ***where flat file information*** *needs to be converted into* ***an object oriented database****. Also as mentioned above, more than one object identifier can be employed in construction of the database".*

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to add the feature of organizing data without using tables as taught by Abineri to the system of White so that the resultant system would comprise storing data structures in non-tabular form. One would have been motivated to do so in order to emphasize generic relations between data structures (Abineri, Paragraph 0061).

White in view of Abineri does not explicitly teach the limitation: "wherein said data instances encapsulated in said data structures can be added, removed, and searched".

On the other hand, Plourde teaches the limitation:

"wherein said data instances encapsulated in said data structures can be added, removed, and searched" (Plourde, Paragraph 0105, i.e., *data structures,* Paragraph 0105, i.e., *removed,* Paragraph 0105, i.e., *saved,* Paragraph 0105, i.e., *adds,* and Paragraph 0104, i.e., *searches*).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of White in view of Abineri to add the feature of adding, removing, and searching data structures, as taught by Plourde, to the system of White in view of Abineri so that the resultant system would comprise data instances encapsulated in data structures which can be added, removed, and searched. One would have been motivated to do so in order to manipulate data structures employing mundane operations, which is notoriously well known in the art.

As per claim 3, White in view of Abineri and further in view of Plourde teaches the limitation:

" wherein a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance" (White, Column 6 Line 22-43 and Column 7 Line 18-38).

As per claim 7, White in view of Abineri and further in view of Plourde teaches the limitation:

"wherein said encapsulated references are in at least one dimensions; and each of said at least one dimensions corresponds to a type of association" (White, Column 7 Line 5-11).

As per claim 9, White in view of Abineri and further in view of Plourde teaches the limitation:

"wherein said common fundamental data structures are application independent and are generally the same for all of said data instances" (White, Column 7 Line 61 through Column 8 Line 3).

Claims 11, 13, 15, and 16 and 53 are rejected on the same basis as claim 9.

As per claim 82, White in view of Abineri and further in view of Plourde is directed to a method to convert a non-data instance centric database to a data instance centric database (Abineri, Paragraph 0106) and teaches the limitations:

"creating encapsulated data instances in said data instance centric database representing elements of said non-data-instance centric database schema and data elements of said non-data-instance centric database" (Abineri, Paragraphs 0049-0068); and

"creating associations amongst the said data instances in said data centric database representing the relationships between said data elements and said schema elements of the non-data-instance centric database and storing said association as a

reference to each associated data instances stored within an independent data structure having a common form encapsulating the associated data instances, which are stored in not-tabular form on a computer-readable media" (Abineri, Paragraphs 0061 and 0067 in view of White Figure 1 and Column 4 Lines 47-55).

As per claim 83, Abineri is directed to the method of claim 82 wherein said converting is through a software agent. The whole system of Abineri is a software agent.

As per claim 84, Abineri is directed to the limitation:

" wherein said non-data instance centric database includes a flat file" (Paragraph 0106).

Claims 85-87 are rejected on the same basis as claim 1.

As per claim 89, White in view of Abineri and further in view of Plourde teaches the limitation:

"wherein said references to associated items are arranged in sets defining the type of association between said item and each of said other items referenced in said set" (White, Figure 3 and Column 7 Line 44-61 "Relation Type Table Entry").

As per claim 92, White in view of Abineri and further in view of Plourde teaches the limitation:

"wherein said items may act as containers for one more member items" (White, Column 6 Line 66 through Column 7 Line 11, Column 7 Line18-38, and Column 6 Line 23-43).

9. Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view Abineri and further in view of Plourde and further in view of and further of Berk (U.S. Patent Application Number 2002/0069240).

As per claim 2, White in view of Abineri and further in view of Plourde as applied to claim 1 teaches the limitation: "within a multi-dimensional organization of said data structures" (White, Column 6 Line 66 through Column 7 Line 11, Column 7 Line 18-38, and Column 6 Line 23-43).

White in view of Abineri and further in view of Plourde does not explicitly teach the limitation: "a reference indicating the location of itself".

On the other hand, Berk teaches the limitation:

"a reference indicating the location of itself" (Berk, Paragraph 0025, i.e., *In an alternate embodiment,* ***the file location pointer itself specifies the location of a computer file stored in a local memory*** *resident in the client computer*).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of White in view of Abineri and further in view of Plourde to add the feature of having a data item referencing its own location, as

taught by Berk, to the system of White in view of Abineri and further in view of Plourde so that, in the resultant method, independent data structures would encapsulate a reference indicating the location of itself. One would have been motivated to so in order to facilitate retrieval of said data structures, which is a well know practice in the art. Self-pointers of data items are commonly employed to facilitate data retrieval in the field of computer software.

10. Claims 5, 8, 18-24, 31-34, 36, 47-48, 50-52, 54-60, 62, 88, 90, and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view Abineri and further in view of Plourde and further of Kroenke et al. (hereinafter "Kroenke")(U.S. Patent Number 5809297).

Referring to claim 5, White in view of Abineri and further in view of Plourde teaches the limitations:

" wherein a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance on said computer-readable media;"

"wherein each of said encapsulated references is a logical index which uniquely identifies each of said associated encapsulated data instances and also encodes the location ("pointers or keys") of each of said associated encapsulated data instances" (White et al., "pointers or keys", Column 7 Line 5-11).

White in view of Abineri does not explicitly teach the limitation: "wherein said logical index is 'm' dimensional, and has 'n' bits per dimension".

On the other hand, Kroenke teaches the limitation:

"wherein said logical index is 'm' dimensional, and has 'n' bits per dimension" (Kroenke, Figure 2, Column 6 Line 26-65, and Column 14 Line 4-17). Kroenke teaches an object data model for semantic relationships wherein such logical indexes (attributes) "m" dimensional (Kroenke et al., Figure 2 and Column 6 Line 26-65) and has "n" bits per dimension (Kroenke et al., "length", Column 14 Line 4-17)).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of White in view of Abineri and further in view of Plourde to add the feature of employing logical indexes, dimensions and bits for creating attributes for a semantic object, as taught by Kroenke, to the system and method taught by White in view of Abineri and further in view of Plourde as applied to claim 1 above so that the combined system would comprise logical indexes which are "m" dimensional and has "n" bits per dimension. One would have been motivated to do so in order to obtain "a system that allows a user to create a relational database schema in a way that does not require the user to be familiar with the underlying database technology or rules for defining a database", thereby enabling the user "to define the data to be stored in a way that mirrors the user's view of the data" (Kroenke et al., Column 2 Line 9-16).

Referring to claim 8, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein each of said at least one dimensions has a plurality of said encapsulated references" (White, Column 7 Lines 5-11, Column 7 Lines 45-52 and Kroenke, Column 6 Line 26-65).

Referring to claim 18, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein said encapsulated references of at least one of the encapsulated data instances are unique and said encapsulated references of at least two of the encapsulated data instances are generally identical" (Kroenke, Figure 2, Column 6 Line 26-65, and Column 14 Line 4-17).

As per claim 19, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein including a plurality of pre-existing encapsulated data instances, having established associations, wherein at least one new encapsulated data instance is associated with at least one of said pre-existing encapsulated data instances" (White, Column 5 Line 3-32).

White in view of Kroenke teaches an object database model (White et al., Column 5 Line 5), which comprises one or more objects (items) and relations that characterize the semantics of the relationships between them (White et al., Column 5

Line 5-10). Being an object database model, said objects encapsulate semantic attributes (semantic relations between/among the objects) along with other attributes. Said objects can be created or destroyed repeatedly. Therefore, said objects (encapsulated data instances) can pre-exist and more such objects can be created at will, establishing relationships between/among those pre-existing and new objects.

As per Claim 20, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein including a plurality of pre-existing encapsulated data instances, having established associations, wherein any of said preexisting encapsulated data instances can be removed disassociated from other pre-existing associated encapsulated data instances can be removed and disassociated fro other per-existing associated encapsulated data instances" (White, Column 5 Line 5-10). White teaches an object database model (White, Column 5 Line 5), which comprises one or more objects (items) and relations that characterize the semantics of the relationships between them (White, Column 5 Line 5-10). Being an object database model, said objects can be removed/dissociated from any other objects (pre-existing or otherwise).

Claim 21 is rejected on the same basis as claim 19. White teaches an object database model (White, Column 5 Line 5), which comprises one or more objects (items) and relations that characterize the semantics of the relationships between them (White, Column 5 Line 5-10). Being an object database model, attributes of the objects can be

arbitrarily changed. In other words, new associations between objects (pre-existing or otherwise) can be added.

Claim 22 is rejected on the same basis as claim 19. White teaches an object database model (White, Column 5 Line 5), which comprises one or more objects (items) and relations that characterize the semantics of the relationships between them (White, Column 5 Line 5-10). Being an object database model, attributes of the objects can be arbitrarily changed. In other words, associations between objects (pre-existing or otherwise) can be removed.

Referring to claim 23, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations:

"a search capability for finding specific unknown encapsulated data instances from a selection criteria of known encapsulated data instances by accessing said known encapsulated data instances representing said selection criteria" (White Column 23 Lines 42-50 and Kroenke Column 12 Lines 15-44) "comprising the steps of":

"accessing references encapsulated with said known encapsulated data instances representing said selection criteria" (White Column 23 Lines 42-50 and Kroenke Column 12 Lines 15-44);

"using Boolean operations to compare said accessed encapsulated references to find references to said specific unknown encapsulated data instances" (White Column 23 Line 42-50 and Kroenke Column 12 Line 15-44); and

"retrieving said specific unknown encapsulated data instances" (White Column 23 Line 42-50 and Kroenke Column 12 Line 15-44).

Referring to claim 24, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations:

"said encapsulated references are embodied as logical indexes in a plurality of dimensions" (White, *pointers or keys* in Column 7 Line 5-11), "each of said dimensions corresponding to a type of association" (White Column 5 Line 3-25 and Column 6 Line 22-43), wherein said accessing further comprises accessing said encapsulated references from said dimensions specified in said selection criteria" (White Column 23 Line 42-50 and Kroenke Column 12 Line 15-44).

Referring to claim 31, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein said encapsulated data instances have attributes of a user interface" (White, Column 5 Line 30-32 and Column 10 Line 12-60).

Referring to claim 32, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein said attributes of a user interface are selected from a group of user views, display elements, and data access methods" (White, Column 5 Line 30-32 and Column 10 Line 12-60).

Referring to claim 33, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"further comprising searching said system wherein the encapsulated references of two or more different encapsulated data instances are used to derive desired results" (White Column 23 Lines 42-50 and Kroenke Column 12 Lines 15-44).

Referring to claim 34, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein said encapsulated references of two or more different encapsulated data instances are compared for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results" (White Column 23 Lines 42-50 and Kroenke Column 12 Lines 15-44).

Referring to claim 36, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations:

"a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance" (White Column 6 Line 66 through Column 7 Line 11, Column 7 Line 18-38, and Column 6 Line 23-43);

"wherein each of said encapsulated references is a logical index which uniquely identifies each of said associated encapsulated data instances and also encodes the

location of each of said associated encapsulated data instances on said computer readable media" (White, *pointers or keys*, Column 7 Line 5-11); and

"wherein said logical index is `m` dimensional, and has `n` bits per dimension" (Kroenke, *length*, Column 14 Line 4-17);

"the encapsulated references of two or more different encapsulated data instances compared such for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results" (White Column 23 Line 42-50 and Kroenke Column 12 Line 15-44).

Claim 47 is rejected on the same basis as claim 23.

Claim 48 is rejected on the same basis as claim 33.

Referring to claim 50, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitation:

"wherein said encapsulated references of at least one of said encapsulated data instances is unique and said encapsulated references of at least two of said encapsulated data instance are generally identical" (White Column 23 Lines 42-50 and Kroenke Column 12 Lines 15-44).

Referring to claim 51, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations:

"said encapsulated references of at least one of said encapsulated data instances is unique and said encapsulated references of at least two of said encapsulated data instance are generally identical" (Kroenke, Figure 2, Column 6 Line 26-65, and Column 14 Line 4-17); and

"searching said system wherein said encapsulated references of different said encapsulated data instances are used to derive desired results" (White Column 23 Line 42-50 and Kroenke et al., Column 12 Line 15-44).

Claim 52 is rejected on the same basis as claim 5. Claim 5 incorporates all the limitations of claim 1.

Claim 54 is rejected on the same basis as claim 23.

Claim 55 is rejected on the same basis as claim 34.

Claim 56 is rejected on the same basis as claim 17.

Claim 57 is rejected on the same basis as claim 18.

Claim 58 is rejected on the same basis as claim 34. Claim 34 incorporates the limitations of claim 33.

Claim 59 is rejected on the same basis as claim 23.

Claim 60 is rejected on the same basis as claim 33.

Claim 62 is rejected on the same basis as claim 18.

As per claim 88, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations:

"wherein said unique reference also serves as an index to physically locate said data instance associated with each of items on said computer-readable media" (White et al., "pointers or keys", Column 7 Line 5-11).

Claim 90 is rejected on the same basis claim 5.

As per claim 93, White in view of Abineri and further in view of Plourde and further in view of Kroenke teaches the limitations:

"wherein the membership of an item within a container item is indicated by an identity in one or more said "m" dimensions in said logical index of said container item and each of said member items" (White, *Type Table Entry* in Column 7 Lines 8-10, Column 5 Lines 48 through Column 6 Line 21, and Column 7 Lines 18-38).

11. Claim 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Abineri and further in view of Plourde and further in view of Kroenke and further in view of Walker et al. (hereinafter "Walker") (U.S. Patent Application Publication Number 2003/0216169).

Referring to claim 27, White in view of Abineri and further in view of Plourde and further in view of Kroenke does not explicitly disclose the limitation:

"said Boolean operations further comprise: basic mathematical operators which result in the direct exclusion of at least one encapsulated reference from the result of said comparing in a single operation".

Walker teaches the limitation:

"said Boolean operations further comprise: basic mathematical operators which result in the direct exclusion of at least one encapsulated reference from the result of said comparing in a single operation" (Walker, Paragraphs 0045-0046).

At the time the invention was made, it would have obvious to a person of ordinary skill in the art to add the feature of combining Boolean operations with basic mathematical operations as taught by Walker to the system taught by White in view of Abineri and further in view of Plourde and further in view of Kroenke et al. as applied to claim 23 so that, in the resultant method, Boolean operations would further comprise basic mathematical operators which result in the direct exclusion of at least one encapsulated reference from the result of said comparing in a single operation. One would have been motivated to do so simply to reduce execution time.

Claim 28-30 is rejected on the same basis as claim 27.

12. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Abineri and further in view of Plourde and further in view Bielak et al. (hereinafter "Bielak") (U.S. Patent Number 5873049).

Referring to claim 40, White in view of Abineri and further in view of Plourde as applied to claim 1 does not explicitly disclose the limitation:

"(a plurality of encapsulated data instances representing) ASCII characters";

"(said common fundamental data structures containing said encapsulated data instances) representing ASCII characters also (containing encapsulated references to encapsulated data instances) using one or more of said ASCII characters;" and

"(said common fundamental data structures containing encapsulated data instances) using one or more said ASCII characters also (containing encapsulated references to said encapsulated data instances) representing said used ASCII characters".

Bielak teaches the limitations:

"(a plurality of encapsulated data instances) representing ASCII characters";

"(said common fundamental data structures containing said encapsulated data instances) representing ASCII characters also (containing encapsulated references to encapsulated data instances) using one or more of said ASCII characters;" and

"(said common fundamental data structures containing encapsulated data instances) using one or more said ASCII characters also (containing encapsulated references to said encapsulated data instances) representing said used ASCII characters" (Bielak, Column 12 Line 64 through Column 13 Line 12). Bielak et al. teaches a system and method for persistent databases, wherein ASCII characters are encapsulated in data objects (Column 12 Line 64 through Column 13 Line 12).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the feature of encapsulating ASCII characters in data objects as taught by Bielak with the system of White in view of Abineri and further in view of Plourde as applied to claim 1 so that the combined system further comprise encapsulated data instances representing ASCII characters, wherein common fundamental data structures containing said encapsulated data instances representing ASCII characters also contain encapsulated references to encapsulated data instances containing said corresponding ASCII characters, and said common fundamental data structures containing said encapsulated data instances containing said corresponding ASCII characters also contains encapsulated references to said encapsulated data instances representing corresponding ASCII characters. One would have been motivated to do so simply because object-oriented model could encapsulate any kind of data, including ASCII characters which are more human-readable than other data types.

13. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Abineri and further in view of Plourde and further in view Eversole et al. (hereinafter "Eversole")(U.S. Patent Application Publication Number 2003/0076978).

Referring to claim 42, White in view of Abineri and further in view of Plourde does not explicitly disclose the limitations:

"a plurality of encapsulated data instances representing Unicode Characters";

"said common fundamental data structures containing said encapsulated data instances representing Unicode characters also containing encapsulated references to

encapsulated data instances using one or more said corresponding Unicode characters;" and

"said common fundamental data structures encapsulated data instances using one or more of said Unicode characters also contains encapsulated references to said data instances representing said used Unicode characters".

Eversole teaches the limitations:

"a plurality of encapsulated data instances representing Unicode Characters";

"said common fundamental data structures containing said encapsulated data instances representing Unicode characters also containing encapsulated references to encapsulated data instances using one or more said corresponding Unicode characters;" and

"said common fundamental data structures encapsulated data instances using one or more of said Unicode characters also contains encapsulated references to said data instances representing said used Unicode characters" (Eversole, Paragraph 0043). Eversole et al. teaches a method for extensible file format, wherein Unicode characters are encapsulated in data objects (Eversole et al., Paragraph 0043).

At the time the invention was made, it would have been obvious to a person ordinary skill in the art to combine the feature of encapsulating Unicode characters in data objects as taught by Eversole et al. with the system of White in view of Abineri and further in view of Plourde as applied to claim 1 so that the combined system further comprise encapsulated data instances representing Unicode characters, common fundamental data structures containing said encapsulated data instances representing

Unicode characters also contain encapsulated references to encapsulated data instances containing said corresponding Unicode characters, and said common fundamental data structures containing said encapsulated data instances representing Unicode characters also contains encapsulated references to said data instances representing corresponding Unicode characters. One would have been motivated to do so object-oriented model could encapsulate any kind of data, including Unicode characters which are more human-readable than other data types.

14. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Abineri and further in view of Plourde and further in view Shwartz et al. (hereinafter "Shwartz") (U.S. Patent Number 5812840).

Referring to claim 44, White in view of Abineri and further in view of Plourde as applied to claim 1 does not explicitly teach the limitations:

"a plurality of encapsulated data instances representing the tokens of a token set of any data type;"

"said common fundamental data structures containing said data instances representing said tokens also containing encapsulated references to encapsulated data instances using one or more of said tokens" and

"said common fundamental data structures containing encapsulated data instances using one or more of said tokens also containing encapsulated references to said encapsulated data instances representing said used tokens" .

Shwartz teaches the limitations:

"a plurality of encapsulated data instances representing the tokens of a token set of any data type;"

"said common fundamental data structures containing said data instances representing said tokens also containing encapsulated references to encapsulated data instances using one or more of said tokens;" and

"said common fundamental data structures containing encapsulated data instances using one or more of said tokens also containing encapsulated references to said encapsulated data instances representing said used tokens" (Column 22 Lines 13-16) . Shwartz et al. teaches a method and system for database query, wherein a set of encapsulated variables are included in an object data structure ("a blackboard").

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the feature of encapsulating token set of any data type in data objects as taught by Shwartz et al. with the system of White in view of Abineri and further in view of Plourde as applied to claim 1 so that the combined system further comprise encapsulated data instances representing a token set of any data type. One would have been motivated to do so simply because object-oriented model could encapsulate any kind of data.

15. Claim 17, 49, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Abineri and further in view of Plourde and further in view of Silberberg et al. (hereinafter "Silberberg") (U.S. Patent Number 6957214).

Referring to claim 17, White in view of Abineri and further in view of Plourde does not explicitly teach the limitation:

"wherein at least one of said encapsulated references is a reference to an encapsulated data instance in another computing environment."

Silberberg teaches the limitation:

""wherein at least one of said encapsulated references is a reference to an encapsulated data instance in another computing environment" (Column 5 Line 48 through Column 6 Line 54). Silberberg et al. discloses architecture for distributed database information access wherein data instances are located in different computing environments (Column 5 Line 48 through Column 6 Line 54).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the feature for accessing data instances in different computing environments as taught by Silberberg et al. with the system taught by White in view of Abineri and further in view of Plourde applied to claim 1 above so that, in the combined system, at least one of said encapsulated references is a reference to an encapsulated data instance in another computing environment. One would have been motivated to do so in order to access "information from a plurality of diverse data sources" (Silberberg et al., Column 4 Line 7-9).

Claim 49 and 61 are rejected on the same basis as claim 17.

16. Claims 94-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Abineri and further in view of Plourde and further in view of Suver (U.S. Patent Number 6016497).

Referring claim 94, White in view of Abineri and further in view of Plourde does not explicitly teach that the limitation:

"wherein each of said items may encapsulate embedded elements."

Suver teaches the limitation: "wherein each of said items may encapsulate embedded elements" (Column 10 Line 9-27). Suver teaches a method and system for storing and accessing embedded information in object-relational databases wherein data instances encapsulate embedded elements (Column 10 Line 9-27).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the feature of embedding elements in object-relational databases as taught by Suver with the system and method of claim 85 as taught by White in view of Abineri and further in view of Plourde so that, in the combined system and method, items would encapsulate embedded elements. One would have been motivated to do so in order to "allow for storing and access of embedded complex information in both the relational data modeling and object-oriented data modeling" (Suver, Column 2 Line 44-48).

Referring to claim 95, Suver teaches the limitation:

"wherein said embedded elements are references to other items" (Column 10 Line 9-27).

Referring to claim 96, Suver teaches the limitation:

"wherein said data instances my contain data of any type" (Column 10 Line 9-27).

Allowable Subject Matter

17. Claims 25-26, 35, 37, 41, 43, 45, 46 and 91 are objected to as being dependent upon a rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims, **assuming correction of claim rejections under 35 U.S.C. 101 above**.

The following is a statement of reasons for the indication of allowable subject matter. Referring to claims 25, White in view of Abineri and further in view of Plourde and further in view of Kroenke is directed to the system and method of claim 23, comprising:

a. finding specific unknown encapsulated data instances from a selection criteria of known encapsulated data instances by accessing said known encapsulated data instances representing said selection criteria (White et al., Column 23 Line 42-50 and Kroenke et al., Column 12 Line 15-44);

b. accessing references encapsulated with said known encapsulated data instances representing said selection criteria (White et al., Column 23 Line 42-50 and Kroenke et al., Column 12 Line 15-44);

c. using Boolean operations to compare said accessed encapsulated references to find references to said specific unknown encapsulated data instances (White et al., Column 23 Line 42-50 and Kroenke et al., Column 12 Line 15-44); and

d. retrieving said specific unknown encapsulated data instances (White et al., Column 23 Line 42-50 and Kroenke et al., Column 12 Line 15-44).

However, White in view of Abineri and further in view of Plourde and further in view of Kroenke et al. fails to teach what claim 25 of the claimed invention recites that, in the said system of claim 23, said encapsulated references are `m` dimensional logical indexes each of which uniquely identifies and encodes the location of said associated encapsulated data instances on said computer readable media, wherein said encapsulated references are filtered by Boolean operations on at least one of said `m` dimensional logical indexes.

Therefore, claim 25 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Referring to claims 26, White in view of Abineri and further in view of Plourde and further in view of Kroenke is directed to the system and method of claim 24, wherein:

a. said encapsulated references are embodied as logical indexes in a plurality of dimensions (White et al., "pointers or keys", Column 7 Line 5-11) ;

b. each of said dimensions corresponds to a type of association (White et al., Column 5 Line 3-25 and Column 6 Line 22-43); and

c. said accessing further comprises accessing said encapsulated references from said dimensions specified in said selection criteria (White et al., Column 23 Line 42-50 and Kroenke et al., Column 12 Line 15-44).

However, White in view of Abineri and further in view of Plourde and further in view of Kroenke et al. fails to teach what claim 26 of the claimed invention recites that, in the said system of claim 24, said encapsulated references are `m` dimensional logical indexes each of which uniquely identifies and encodes the location of said associated encapsulated data instances on said computer readable media, wherein said encapsulated references are filtered by Boolean operations on at least one of said `m` dimensional logical indexes.

Therefore, claim 26 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Referring to claim 35, White in view of Abineri and further in view of Plourde and further in view of Kroenke et al. is directed to the system of claim 34 wherein encapsulated references of different said encapsulated data instances are compared such for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results. However, White in view of Abineri and further in view of Kroenke et al. fails to teach what claim 35 of the claimed invention recites that, in the said system of claim 34, the encapsulated references of two or more different encapsulated data instances are stored in an order based on value and are

compared such for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results.

Therefore, claim 35 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Referring to claim 37, White in view of Abineri and further in view of Plourde and further in view of Kroenke et al. is directed to the system of claim 33 wherein encapsulated references of different said encapsulated data instances are used to derive desired results. However, White in view of Abineri and further in view of Plourde and further in view of Kroenke fails to teach what claim 37 of the claimed invention recites that, in the said system of claim 33, each of said at least one dimensions has a plurality of said encapsulated references; and said encapsulated references of two or more different encapsulated data instances are stored in an order based on value and are compared for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results.

Therefore, claim 37 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Referring to claim 41, White in view of Abineri and further in view of Plourde and further in view of Bielak et al. as applied to claim 40 teaches that the system comprises encapsulated data instances representing ASCII characters, wherein common fundamental data structures containing said encapsulated data instances representing

ASCII characters also contain encapsulated references to encapsulated data instances containing said corresponding ASCII characters, and said common fundamental data structures containing said encapsulated data instances containing said corresponding ASCII characters also contains encapsulated references to said encapsulated data instances representing corresponding ASCII characters.

However, White in view of Abineri and further in view of Plourde and further in view of Bielak et al. as applied to claim 40 does not teach that said encapsulated references with a given ASCII character data instance refer to other encapsulated data instances using said ASCII characters based on the position of said given ASCII character in the sequence of said ASCII characters in said encapsulated data instances.

Therefore claim 41 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Referring to claim 43, White in view of Abineri and further in view of Plourde and further in view of Bielak et al. as applied to claim 42 teaches that the system comprises encapsulated data instances representing Unicode characters, wherein common fundamental data structures containing said encapsulated data instances representing Unicode characters also contain encapsulated references to encapsulated data instances containing said corresponding Unicode characters, and said common fundamental data structures containing said encapsulated data instances containing said corresponding Unicode characters also contains encapsulated references to said encapsulated data instances representing corresponding Unicode characters.

However, White in view of Abineri and further in view of Plourde and further in view of Bielak et al. as applied to claim 42 does not teach that said encapsulated references with a given Unicode character data instance refer to other encapsulated data instances using said Unicode characters based on the position of said given Unicode characters in the sequence of said Unicode characters in said encapsulated data instances.

Therefore claim 43 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Referring to claim 45, White in view of Abineri and further in view of Plourde and further in view of Bielak et al. as applied to claim 44 teaches that the system comprises encapsulated data instances representing token set of any data type, wherein common fundamental data structures containing said encapsulated data instances representing token set of any data type also contain encapsulated references to encapsulated data instances containing said corresponding token set of any data type, and said common fundamental data structures containing said encapsulated data instances containing said corresponding token set of any data type also contains encapsulated references to said encapsulated data instances representing corresponding token set of any data type.

However, White in view of Abineri and further in view of Plourde and further in view of Bielak et al. as applied to claim 44 does not teach that said encapsulated references with a given token data instance refer to other encapsulated data instances

using said token based on the position of said given token in the sequence of said tokens in said encapsulated data instances.

Therefore claim 45 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Referring to claim 91, White in view of Abineri and further in view of Plourde and further in view of Kroenke et al. as applied to claim 90 fails to teach that, in the system of claim 90, "m" is 4 and "n" is 30. Therefore claim 90 is allowable if written in an independent form, assuming correction of the claim objections and claim rejections under 35 U.S.C. 101 above.

Contact Information

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Myint whose telephone number is (571) 272-5629. The examiner can normally be reached on 8:30AM-5:30PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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